Panagiotis Leventogiannis

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Electrical and computer engineer focused on non-invasive brain-computer interfaces. Built a complete motor imagery BCI from EEG acquisition to real-time control of a robotic hand, with a particular interest in rigorous evaluation of decoder generalization and in robust machine learning decoders for EEG that can run on wearable hardware. Currently a research trainee at g.tec medical engineering. Seeking a research position leading to a PhD in neural engineering, BCI or neurorehabilitation.

Education

University of the Peloponnese — Patras, Greece
Diploma in Electrical & Computer Engineering (5-year integrated Master's, EQF Level 7) — *2020 – 2026*

- Thesis: *EEG-Based Control of an Open-Source Anthropomorphic Robotic Hand: The InMoov i2*. Supervisor: Asst. Prof. Athanasios Koutras
- Relevant coursework: Signals & Systems, Machine Learning, Embedded Systems, Digital Design on FPGAs

Research Experience

g.tec medical engineering GmbH — Schiedlberg, Austria
Research Trainee (Erasmus+), Signal Processing Group. Supervisor: Johannes Grünwald — *Oct 2026 – Present*

- Daily development with g.Pype, g.tec's Python BCI SDK, building distributed real-time BCI demonstrators: React mobile apps stream to a g.Pype backend that processes data and forwards results live to web dashboards.
- Hands-on acquisition and integration with g.USBamp, g.HIamp, g.Nautilus, Unicorn and BCI Core-8 EEG systems.

Diploma Thesis, University of the Peloponnese — Patras, Greece
Motor Imagery BCI for Robotic Hand Control — *2025 – 2026*

- Designed and ran an EEG study with 14 participants (320 trials each) using an OpenBCI Cyton over sensorimotor channels (C3, C4, Cz, FC3, FC4, FCz, CP3, CP4) at 250 Hz, following the Graz-BCI paradigm (motor imagery vs. rest) with LSL event markers; confirmed mu-band ERD over motor cortex.
- Implemented a decoding pipeline with regularized CSP (Ledoit-Wolf) and four classifiers: LDA, linear and RBF SVM, and Riemannian MDM.
- Showed that standard 10-fold cross-validation overestimates performance (62.2%) compared with leave-one-run-out validation (59.1%), where only 6 of 14 participants generalized to an unseen run; the group-level effect remained significant (Wilcoxon $p = 0.003$). Validated results with permutation testing, Cohen's kappa and per-class F1.
- Closed the loop with an InMoov i2 hand driven by custom Arduino firmware (PCA9685 PWM servo control), reaching 72.5% correct hand commands on unseen data.
- Code: github.com/PanosLevedogiannis/eeg-bci-hand

Projects

Biomedical Signal Classification (EEG / ECG)
Seizure (CHB-MIT) and arrhythmia (MIT-BIH) detection; wavelet features, SVM/RF vs. CNN/LSTM — *Oct 2025 – Feb 2026*

Real-Time Fall Detection
Webcam pose estimation (MoveNet) with fall detection and alerts — *Oct 2024 – Feb 2025*

Other Experience & Training

Co-Founder & Software Engineer, psaxno-douleia-nafplio.gr — Nafplio, Greece
Built and run a regional job platform end to end; profitable within months, 100+ listings — *Mar 2024 – Present*

g.tec BCI & Neurotechnology Spring School, 140-hour program on BCI, EEG and neurorehabilitation — 2025

Skills

Programming & tools: Python (g.Pype, MNE, pyRiemann, scikit-learn, NumPy, SciPy, BrainFlow, matplotlib), MATLAB, C, Bash, JavaScript, SQL, Git, Linux, LaTeX
Neuro / signal processing: EEG acquisition and preprocessing, ERD/ERS analysis, CSP, Riemannian methods, cross-validation design, statistical testing, Lab Streaming Layer
Hardware: g.USBamp, g.HIamp, g.Nautilus, Unicorn, BCI Core-8, OpenBCI Cyton, Arduino, FPGA design (VHDL), electronics
Languages: Greek (native), English (fluent, ECCE), German (B1)

References

Asst. Prof. Athanasios Koutras, thesis supervisor, University of the Peloponnese, koutras@uop.gr
Asst. Prof. Georgios Souliotis, University of the Peloponnese, gsoul@uop.gr